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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/825,268	04/03/2001	Dan Raphaeli	2681/OJO69USO	2081
25937	7590	08/16/2004	EXAMINER	
ZARETSKY & ASSOCIATES PC 8753 W. RUNION DR. PEORIA, AZ 85382-6412			ODOM, CURTIS B	
			ART UNIT	PAPER NUMBER
			2634	

DATE MAILED: 08/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/825,268	Applicant(s) RAPHAELI, DAN	
	Examiner Curtis B. Odom	Art Unit 2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 03 April 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-77 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 25 and 28-32 is/are allowed.
- 6) ☒ Claim(s) 1-24, 26, 27 and 55-77 is/are rejected.
- 7) ☒ Claim(s) 33-54 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 April 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION*****Drawings***

1. The drawings are objected to because in Fig. 2, reference character "16" is suggested to point to the "SYCHRONIZATION/CHANNEL ESTIAMTION" block. Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference character(s) mentioned in the description: **received signal from channel  $x(n)$  25; channel estimation information  $h_i$  28; and channel estimate matrix element  $h_{10}$  27** (see page 16, lines 13-16). Corrected drawing sheets are required in reply to the

Art Unit: 2634

Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Specification*

3. The disclosure is objected to because of the following informalities:
  - a. On page 1, line 17, the word "transmitted" is suggested to be changed to "transmitted data".
  - b. On page 10, line 32, the word "use" is suggested to be changed to "used".
  - c. On page 11, line 20, " $h_n$ " is suggested to be changed to " $h_i$ ".
  - d. On page 12, line 8, " $B_n$ " is suggested to be changed to " $B_{j-i}$ ".
  - e. On page 12, line 9, " $h_n$ " is suggested to be changed to " $h_i$ ".
  - f. On page 13, line 16, " $x_n$ " is suggested to be changed to " $x_{i+n}$ ".
  - g. On page 13, line 17, " $h_n$ " is suggested to be changed to " $h_i$ ".

Appropriate correction is required.

*Claim Objections*

4. Claims 1-24, 33-77 are objected to because of the following informalities:

a. In claim 1, line 4, the phrase "the influence" is suggested to be changed to "an influence".

b. In claim 3, line 20, the phrase "said other symbols" is suggested to be changed to "said previously estimated symbols".

c. In claim 10, line 8, the phrase "said correlation values" is suggested to be changed to "said correlation results".

d. In claim 11, line 10, the phrase "said correlation values" is suggested to be changed to "said correlation results".

e. In claim 33, line 21, the phrase "said symbols" is suggested to be changed to "said transmitted symbols".

f. In claim 34, line 24, the phrase "the influence" is suggested to be changed to "an influence".

g. In claim 34, line 27, the phrase "said channel response" is suggested to be changed to "said channel impulse response".

h. In claim 38, line 5-6, the phrase "said estimated symbols" is suggested to be changed to "said previously estimated symbols".

i. In claim 39, line 7, the phrase "the length" is suggested to be changed to "a length".

Art Unit: 2634

- j. In claim 45, lines 20-21, the phrase "the symbol decision" is suggested to be changed to "a symbol decision".
- k. In claim 47, line 25, the word "fourth" is suggested to be deleted".
- l. In claim 48, line 1, the phrase "said fourth means" is suggested to be changed to "said means for applying".
- m. In claims 56-58, the word "symbol(s)" is suggested to be changed to "signal(s)".
- n. In claim 63, line 7, the phrase "the length" is suggested to be changed to "a length".
- o. In claim 67, line 24, the phrase "the influence" is suggested to be changed to "an influence".
- o. In claim 69, line 8, the phrase "said other symbols" is suggested to be changed to "said previous symbols".
- p. In claim 76, line 25, the phrase "the length" is suggested to be changed to "a length".
- q. In claim 77, line 3, the phrase "said symbols" is suggested to be changed to "said transmitted symbols".

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 2634

6. Claims 1-24 and 55-77 recite the limitation "said steps of calculating selecting, removing, correlating, estimating, and updating" in claims 1, 8, 9, 23, 24, 55, 64, 65, 67, 74, 75, and 77.

However, the limitation "updating step" is not recited in the claims or preceding claims. There is insufficient antecedent basis for this limitation in the claim.

7. Claims 26 and 27 recite the limitations "said soft symbol output" and "said soft decision". There is insufficient antecedent basis for this limitation in the claim.

### ***Allowable Subject Matter***

8. Claims 25, and 28-54 are allowable over prior art references (if above objections are overcome) because related references do not disclose an equalization technique comprising of removing an influence of previously estimated symbols from a received symbol using the impulse response of the previous symbols and correlating the channel response with the modified received symbol to produce a matched filter output.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Omura et al. (U. S. Patent No. 6, 559, 894) discloses an equalization technique comprising of correlating to produce an impulse response and correlating the impulse response with a reference segment.

Art Unit: 2634

Stuart et al. (U. S. Patent No. 3, 875, 515) discloses an equalization technique which involves subtraction the impulse response to remove interference from a received signal.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 703-305-4097. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Curtis Odom  
August 3, 2004



**STEPHEN CHIN**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2634**